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THREE NEW GENERA AND THREE NEW SPECIES OF CIMICIDAE FROM NORTH AMERICA.[1]

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In the preparation of this paper the writer has had an opportunity to carefully study the Cimicidae collection of the United States National Museum, Washington, D. C., the University of Nebraska, Lincoln, Nebraska, the Colorado Agricultural College, Fort Collins, Colorado, the Montana State College, Bozeman, Montana, and the Iowa State College. All the new material here described is from the National Museum and the University of Nebraska collections. The descriptions were made with only the National Museum material before me, but just after the manuscript had been sent to press it became known to Professor Myron H. Swenk, University of Nebraska, Lincoln, Nebraska, that some material in the University of Nebraska collection which had just been described under the name of *Cimex micropodidorum* by Messrs. Everett E. Wehr and Leonard G. Worley of his department, was probably identical with one of the species just described by me. Desiring to prevent the creation of a synonym, Professor Swenk wrote me of their work and sent a copy of the paper by Wehr and Worley and one of their drawings. It seemed quite certain from these that the material was the same so the publication of both papers was temporarily suspended and an exchange and comparison of material made, with the result that the Nebraska collection was found to contain excellent specimens of two of the species I had just described from the National Museum. The paper by Wehr and Worley was withdrawn from publication and the Nebraska material made paratypes of the new species, *Cimexopsis nyctalis*, and *Synxenoderus comosus* herein described. The

[1]Contributed from the Department of Entomology, Iowa State College, Ames, Iowa.

valuable biological notes on the Nebraska specimens are quoted from the unpublished paper of Wehr and Worley.

The new genera have not been placed in the sub-family grouping of the Cimicidae as established by Jordan and Rothschild, "Notes on Clinocoridae, a Family of Rhynchota, with the Description of a New Genus and Species, Novitates Zoologicae, Vol. XIX, 1912, pp. 352-356." The rostral character, especially, makes such a placing difficult if not impossible. It is planned to take up this point in a subsequent paper. As the writer is preparing a monograph and key to the North American species, he would be glad to receive, at the Colorado Agricultural College, Fort Collins, Colorado, material for study and determination.

All holotypes and allotypes are deposited in the United States National Museum, Washington, D. C.

I wish to express my thanks to Drs. C. J. Drake and H. H. Knight for many suggestions given during this study and to those that made the study possible through the loan of material, especially W. L. McAtee of the United States National Museum, and F. C. Bishopp of the United States Bureau of Entomology. I am especially grateful to Myron H. Swenk, Everett E. Wehr and Leonard G. Worley of the University of Nebraska for the loan of material that they were describing and for their efforts in avoiding duplication and synonymy in the literature of the Cimicidae. It has been a pleasure to meet with their high scientific ideals and attitude of fairness.

Hesperocimex, new genus.

Coxae subcontiguous. Mesosternum subtriangular, and produced forward as a sharp keel almost to posterior point of the prosterum; metasternum compressed between the middle coxae, widening posteriorly into a short rounded point two-thirds as wide as a hind femur; pronotum broad, lateral margins almost uniformly reflexed and broadly rounded; scutellum transverse and broadly rounded posteriorly; rostrum extending to middle of anterior coxae; bristles variable in length, some as long as two times the width of an eye; form broadly ovate, male copulatory organ short and almost straight.

Genotype: *Hesperocimex coloradensis,* new species.

Hesperocimex coloradensis, new species.

Suggestive of *Oeciacus vicarius* Horv. but differing from it by the metosternum being sharply compressed between the middle coxae; the meso-

sternum subtriangular; the hairs of the head, thorax and abdomen being less dense, more variable in length, and dentate only on the tip; the broadly rounded scutellum; the much broader and more reflexed pronotum; the unemarginate fourth abdominal sternite of female; the absence of the tibal brush from all tibia of female; the differently proportioned antennae, hemelytra and male copulatory organ.

Color, yellowish brown. Head, thorax, hemelytra, abdomen and legs covered with medium fine hairs of varying length. Form, broadly ovate. Length 3.3-3.8 mm.; width 2.1–2.6 mm.

Head broad and deeply set into pronotum; greatest length .74 mm.; width through eyes 1.02 mm.; width of vertex between dorsal margin of eyes .81 mm.; irregularly strigate on middle of head and on to the base of tylus. Eyes smaller and not as prominent as in *Haematosiphon inodorus* Duges. Clypeus distinctly broader than in *O. vicarius* Horv. and slightly broader than the distance between the bases of the antennae. Antennae pilose, the pubescence finer than in *O. vicarius* except on second segment where the length of the longer pile equals two and one-half times the thickness of segment. Length of segments: II = .46 mm.; III = .36 mm.; IV = .27 mm. Second segment very slightly but gradually becoming thicker toward the apex, the third and fourth slightly more slender, and thinner than the thickness of the basal portion of second. Epipharynx (labrum with some authors) not prominent from dorsal view of head. Rostrum extends to the middle of the anterior coxae, length from anterior margin of head to apex 1.08 mm.

Coxae subcontiguous; the intermediate pair being separated only by a much compressed anterior point of the metasternum; and the posterior pair by the raised intercoxal process of the abdomen. The metasternum much longer than wide, but widening back of the intermediate coxae into a short rounded point two-thirds as wide as a hind femur. Mesosternum subtriangular and produced anteriorly as a sharp keel almost to the posterior point of the prosternum. Legs stout, hairs on tibiae coarse and spine-like, tarsal claws simple and slender. Apical tuft of hair wanting on all tibia of female.

Pronotum broad, uniformly punctulate; apex moderately, uniformly and concavely arcuate; the anterior angles reaching slightly beyond the posterior margin of eyes; posterior angles rounded; lateral margins almost uniformly reflexed and strongly rounded. Width of pronotum 1.6 mm.; length on median line .57 mm. Scutellum transverse and broadly rounded behind. Length along median line .2 mm.; width .94 mm.

Hemelytra densely punctulate; their entire surface clothed with hairs which are more dense and longer on the lateral margins, the length varying from less than one-half the width of an eye to two times this width; transverse, shortest at the suture and longest at one-fourth the distance from lateral margins, practically covering the metathorax, except at middle; width 1.04 mm.; suture very short, a slight overlapping of the inner margins is the rule; posterior (apical) margin slightly sinuate, inner angles broadly rounded, lateral margins not reflexed.

Abdomen broadly ovate, with the dorsum less densely clothed with

shorter hairs than occur on *O. vicarius*, their length being less than the width of an eye except on the lateral edges of each segment where from two to six occur that may be as much as two times as long as the width of an eye; male genital segments asymmetrical; male copulatory organ short, almost straight and thickened at base; fourth abdominal sternite unemarginate on apex.

Holotype: Female, taken February 16, 1916, Colorado Springs, Colorado, by W. D. Edmonston, host not given. Allotype: March 13, 1916, Colorado Springs, Colorado, W. D. Edmonston, infesting house of W. H. Manning. Paratypes, five of same collection as allotype and one labeled "Mexico" found in nest of the Purple Martin (*Progne purpurea*). The last named paratype was confused by G. Horvath (Revision of the American Cimicidae, Annales Musei Nationalis Hungarici, Vol. 10, 1912, pp. 257–262) with *Oeciacus vicarius* Horvath.

Cimexopsis, new genus.

Resembles *Haematosiphon* in general appearance but has a rostrum reaching only to the middle of anterior coxae; a much more broadly rounded scutellum; a more compressed and less prominent metasternum and unsinuated apical margins to the posterior abdominal segments; form ovate. Other characters quite similar to *Haematosiphon*.

Genotype: *Cimexopsis nyctalis*, new species.

Cimexopsis nyctalis, new species.

This species resembles *H. inodorus* but is readily distinguished from it by the short rostrum; the smaller eyes; the more broadly rounded scutellum; rounded posterior margin of hemelytra; the unsinuated apical margins of the posterior abdominal segments.

Color yellow-amber. Head, thorax, abdomen, and legs covered with very fine and short hairs as in *Haematosiphon inodorus* Duges. Hairs dentate only on tip. Form less ovate and size somewhat smaller than in *H. inodorus*. Length 2.6–3 mm., width 1.5–2 mm.

Head broad, set into pronotum to the eyes, finely punctulate, clothed with very fine short hairs; greatest length .56 mm.; width through eyes .68 mm.; width of vertex, between dorsal margins of eyes, .54 mm. Clypeus scarcely as broad as the space between the base of antennae and with a prominent hair on each apical angle; width .17 mm. or just one-half that of vertex, while in *H. inodorus* the clypeus is more than one-half the width of vertex. Eyes smaller and not as prominent as in *H. inodorus*. Antennal segments almost filiform, the third and fourth somewhat thinner than second; pilose, the pile of the second segment being less in length than the diameter of the segment while the pile of the third and fourth is equal to or longer than the diameter of these segments. Lengths of segments: II = .44 mm.; III = .40 mm.; IV = .36 mm. Rostrum much shorter than in *H. inodorus*, extending to the middle of the anterior coxae, length from anterior margin of head to apex .74 mm. Epipharynx not prominent from dorsal view of head.

Coxae subcontiguous; the intermediate pair being separated only by a

much compressed metasternum which is even less prominent than in *H. inodorus* and only slightly developed posterior to the coxae; the posterior pair separated by the raised intercoxal process of the abdomen which is more compressed between the coxae than in *H. inodorus*. Mesosternum rounded posteriorly. Legs medium stout and clothed with comparatively short hairs, tarsal claws simple and slender; apical tufts of hairs absent from hind tibia of both sexes and inconspicuous on the other tibia.

Pronotum obsoletely punctulate; apex moderately and concavely arcuate with anterior angles more produced than in *H. inodorus* and reaching somewhat beyond posterior margins of eyes; lateral margins uniformly reflexed but less acutely and more narrowly so than in *H. inodorus* and moderately and almost uniformly rounded; posterior margin almost truncate; covered with short hairs, those on the lateral margins only a very little longer than the others and directed posteriorly. There are two hairs on each posterior lateral angle, equal in length to twice the width of an eye. Length on median line .44 mm., width 1.06 mm.

Scutellum transverse, shorter and distinctly more broadly rounded behind than in *H. inodorus;* length .18 mm., width .64 mm. Hemelytra densely punctate, clothed with very short hairs except on the lateral margins where there are a few as long as the width of an eye; lateral margins strongly reflexed; posterior margin rounded, being distinctly more rounded toward the inner angle; commissural margin straight for a distance of .12 mm.

Abdomen narrowly ovate, with the first dorsal suture straight as in *H. inodorus* but the succeeding ones lacking the profound sinuousness that characterizes them in *H. inodorus*. Male genital segments asymmetrical, male copulatory organ of medium length, uniformly curved and fitting into a groove that extends into the apex of the seventh segment.

Holotype: female, taken in the Zoological Park, Washington, D. C., July, 1921. Host and collector not known. Allotype: same data as the type. Paratypes: ten females and five males, bearing same labels as type, in the National Museum and the author's collection; three males, one taken October 8, 1922, and two November 13, 1922, by Mrs. W. Wessel, Nebraska City, Otoe County, Nebraska, from floor of a fireplace leading to a chimney in which chimney swifts had been nesting, in the University of Nebraska collection. Besides the above, there are in the United States National Museum one male and four females mounted in balsam and four immature specimens on points, collected with type.

In regard to the paratypes in the University of Nebraska collection Messrs. Wehr and Worley wrote as follows:

"On October 8, 1922, a woman residing in Nebraska City, Otoe County, Nebraska, made a visit to the Department of Entomology of the University of Nebraska, to learn if something could be done to rid her house of bedbugs. She brought with her in a bottle a specimen of the pest. A casual examination of the insect was sufficient to satisfy the members of the Department that it was not the common bedbug (*Cimex lectularius*). It was much smaller in size and seemed otherwise different. When we

were told by the woman that numerous bedbugs, both alive and dead, had been found in the cracks of the woodwork around the chimney and on the floor of the fireplace, the possibility of these parasites being one of the bird-infesting species immediately occurred to us. It has long been known that a certain species of bedbug (*Oeciacus vicarius*) inhabits the nests of swallows. Upon further inquiry we learned that a few months previously Chimney Swifts (*Chaetura pelagica*) had been noticed flying in and out of the chimney and that the chimney had been closed against them by boarding over the top.

"As a result of this complaint the senior author visited this home a few days later for the purpose of collecting more specimens of the bedbugs, if possible, and to see if something could be done to free the house of the pests. With no certainty as to the exact habits of this particular species of bedbug, a thorough search was made throughout the house to determine if there were other places than the fireplace that might be frequented by these insects. As no additional specimens could be found at the time, it was believed that these bedbugs were practically restricted to the region about the fireplace of the house. This belief was greatly strengthened a few days later when two more specimens of this same species of bedbug were taken from the floor of the fireplace and sent to the Department of Entomology by the woman living in the house. Altogether, the circumstantial evidence is such as to indicate that the Chimney Swifts were the normal hosts of the bugs and that some months after the chimney was closed the insects were forced by hunger to invade the house from the chimney. There they died, or were picked up by the diligent keeper of the house."

Synxenoderus, new genus.

Form narrow; head long, the portion anterior to the anterior margin of eyes equal to one-half length of head; gula arched with prominent tubercle on median line of posterior margin; prosternum greatly arched and short; metasternum compressed but more prominent than in *Haematosiphon;* pronotum narrowed posteriorly with lateral sides sharply reflexed; tip of abdomen clothed with about fifty posteriorly directed, truncate hairs; rostrum extending to posterior margin of anterior coxae.

Genotype: *Synxenoderus comosus,* new species.

Synxenoderus comosus, new species.

This species is darker in color, smaller and much narrower in form, especially through the head and thorax than *Haematosiphon inodorus* Duges or *Oeciacus vicarius* Horv. Head thick, anterior coxal cavities large. Length 2.80–3.60 mm., width 1.60–1.90 mm. Head, thorax, abdomen and legs sparsely clothed with short fine hair. Hairs dentate only at tip.

Head strigate on middle and on to base of tylus, the fine lines forming more acute angles toward the apex than in *Hesperocimex coloradensis* n. sp. Length .68 mm.; width through eyes .70 mm.; width of vertex between dorsal margins of eyes .52 mm. Eyes smaller in size and less prominent

than in *Haematosiphon inodorus* Duges. Clypeus long and narrow, the length of the portion of the head anterior to the anterior margin of the eyes equals one-half of the total length of head, while in *H. inodorus, O. vicarius,* and *Cimexopsis nyctalis,* this distance is considerable less than one-half the head length; width slightly less than distance between bases of antennae and sub-equal to one-half the distance between the dorsal margins of eyes. Epiphrynx prominent from dorsal view of head. Antennae filiform and pilose; thickness of the 3d and 4th segments about one-half that of the 2d. Length of segments: II = .5 mm.; III = .42 mm.; IV = .32 mm. Rostrum extending to posterior margin of front coxae, length from anterior margin of head to apex 1.04 mm. Gula more convex than in other American forms and produced into a prominent tubercle on the middle of the posterior margin; thickness of head at this point .56 mm., which is greater than the width of vertex, while in *H. inodorus, O. vicarius* and *C. nyctalis* the proportions of the head thickness to width of vertex are as 42 to 56, 40 to 58, and 42 to 54, respectively.

Coxae subcontiguous, intermediate pair separated only by the much compressed anterior point of metasternum; posterior pair somewhat more separated by the inter-coxal process of the abdomen than in *H. inodorus* and *C. nyctalis.* The anterior coxal cavities large, deep, and almost transverse. Prosternum with anterior margin greatly arched to receive gula with its prominent tubercle; much shortened and lacking the horizontal triangular development common to all other American forms. Metasternum more raised and more prominent than in *H. inodorus* and slightly broader posterior to the mid coxae.

Legs moderately long, tarsal claws simple and slender. Apical tuft of hair very prominent and expanded on fore and mid tibia and absent from hind tibia in both sexes.

Pronotum obsoletely punctulate; sparsely clothed with short hairs except on lateral margins where there are a few much longer ones, some of them as long as the 4th segment of antennae; narrowed behind; greatest width .98 mm., width on posterior margin one-fifth less; length on median line .44 mm. Apex, strongly concavely arcuate, anterior angles more acute and more produced than in *H. inodorus* and *Cimexopsis nyctalis;* lateral margins moderately rounded, narrowly and more strongly reflexed than in *H. inodorus* and *C. nyctalis,* the reflexed portion narrowing posteriorly; base truncate, posterior angles rounded.

Scutellum short, transverse and broadly rounded behind; length .10 mm., width .6 mm. Hemelytra small, transverse, punctulate, hairs sparse and only slightly longer than with *H. inodorus,* except on lateral margins, where a few are as long as two times the width of an eye; lateral margins not reflexed, posterior margin straight, inner apical angle evenly rounded making only a very short commissural line.

Abdomen ovate, first segment longer than the pronotum on the median line; tip clothed with about fifty posteriorly directed, stiff, truncate hairs, each hair equal in length to the width of an eye. Male genital segments asymmetrical; male copulatory organ medium in length, moderately curved and fitting into a groove that extends on to the apex of the seventh sternite.

Holotype: female taken in the nest of the White-throated Swift (*Aeronautes melanoleucus*) Colton, California, May 22, 1918, by W. C. Hanna. Allotype: same data as type. Paratypes: three males and eight females collected with type, in the U. S. National Museum and the writer's collection: two males and two females taken in nest of White-throated Swift, Warbonnet Cañon, Sioux County, Nebraska, June 2, 1901, by M. A. Carriker, Jr., in University of Nebraska collection. There are eleven immature specimens in the National Museum which were taken with the type.